



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Washington

## Collaborative Efforts Reduce Bacteria Levels in Upper Fishtrap Creek and Upper Tenmile Creek

### Waterbodies Improved

High fecal coliform (FC) bacteria levels from nonpoint sources in Washington's lower Nooksack River violated water quality standards in the mid-1990s, prompting the Washington Department of Ecology (Ecology) to add numerous segments of the lower Nooksack River watershed to the state's Clean Water Act (CWA) section 303(d) list of impaired waters. The high FC levels also polluted Portage Bay shellfish beds, causing the Lummi Nation to voluntarily close the shellfish beds to harvesting. Watershed stakeholders completed a total maximum daily load (TMDL) study and implemented numerous best management practices to reduce FC, including nutrient management planning, excluding livestock from streams, and upgrading septic systems. These efforts have caused FC levels to drop, allowing three Nooksack River tributary segments to be removed from the list of impaired waters in 2008.

### Problem

The 826-square mile Nooksack River Basin flows primarily through Whatcom County in northwestern Washington State. While the upper Nooksack River flows through predominantly forested mountainous land of the Cascade Range, the lower Nooksack River drains primarily agricultural land. The Lummi Nation Reservation covers 33 square miles at the mouth of the Nooksack River near Portage Bay.

Monitoring in 1997 and 1998 showed that numerous segments in the lower Nooksack River Basin violated Washington's water quality standard for FC bacteria in freshwater. The lower Nooksack River is a Class A water, which requires that FC levels not exceed a geometric mean value of 100 colonies (col) per 100 milliliters (mL) and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceed 200 col/100 mL. In 1996 and 1998 Ecology added 20 Nooksack River Basin segments to the state's CWA section 303(d) list for FC impairments.

In June 2000 Ecology developed a TMDL establishing FC pollution limits for the Nooksack River Basin. The TMDL identifies the key FC pollution sources as agriculture and leaking septic tanks. Municipal wastewater treatment plants also contribute. To ensure protection of downstream shellfish beds, the TMDL establishes FC geometric mean targets that are more stringent than water quality standards (Figure 1). The TMDL geometric mean targets range from 39 col/100 mL to 85 col/100 mL, depending on the subwatershed and its location within the larger Nooksack River Basin. Ecology worked closely with the Lummi Nation, Whatcom Conservation

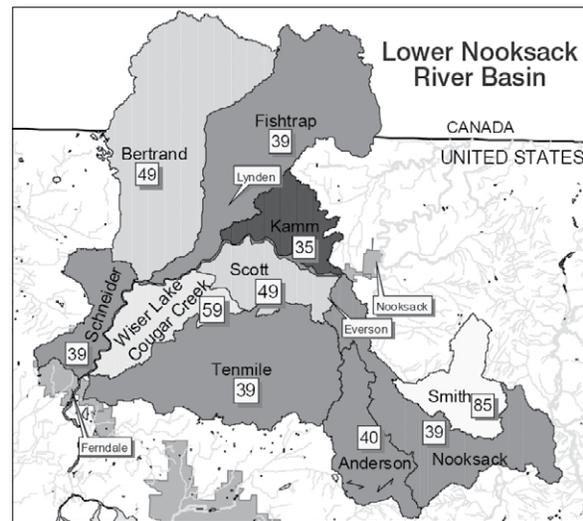


Figure 1. The 2000 TMDL assigns each lower Nooksack River tributary a geometric mean target value (noted in boxes) that should ensure that downstream shellfish bed health is protected.

District (CD) and other stakeholders to develop a 2002 detailed implementation plan to help guide efforts to reduce FC.

### Project Highlights

Nooksack River Basin stakeholders have worked to reduce FC levels through a variety of efforts. In 1998 Washington implemented a new state program that requires all dairies to adopt nutrient management plans and undergo regular inspections. Farmers in the basin now operate more than 50,000 acres under nutrient management plans. Many farmers across

the basin installed fences to exclude animals from creeks and are spreading manure only when fields can absorb it. Landowners have also installed hedgerows along 26 miles of watercourses and more than 400 miles of filter strips to protect against overspray and runoff of manure.

The Whatcom County Health Department and Lummi Natural Resources Department conduct on-site septic inspections in sensitive, high-risk areas and have worked with homeowners to replace numerous failing systems. Several partners hosted workshops to teach people about septic systems and how to care for them. The cities of Everson, Lynden and Ferndale have improved their sewer collection and waste treatment systems to minimize the amount of bacteria discharged into the Nooksack River. The cities have also implemented stormwater management plans.

The community-based Tenmile Creek Watershed Restoration Project worked with landowners to identify and correct pollution problems from agricultural land and leaking septic systems in Tenmile Creek, a major tributary of the Nooksack River. The Tenmile Creek project began a local program called Farmers Growing Trees for Salmon in 2001. Local farmers grow the trees and give them away to Whatcom County residents for water quality enhancement projects. Nooksack River Basin landowners have planted more than 60,000 trees since the program began. The Whatcom CD received an Ecology grant (CWA section 319 funds), which supported hiring a Tenmile Creek project manager and installing 11 miles of hedgerows and riparian buffers in that 35-square mile watershed alone.

## Results

FC bacteria data show that three segments—the two uppermost segments of Double Ditch Drain (tributaries of Fishtrap Creek at the border with Canada) and the uppermost segment of Tenmile Creek—have consistently met both water quality standards and TMDL targets (Figure 1), prompting Ecology to remove them from Washington's impaired waters list in 2008. The key efforts that likely helped restore the Double Ditch Drain and Tenmile Creek segments include repairing leaking septic systems and implementing new dairy regulations. The Double Ditch improvements also reflect water quality flowing in from the Canadian portion of this watershed. Tenmile Creek also benefitted from targeted streambank protection and restoration efforts.

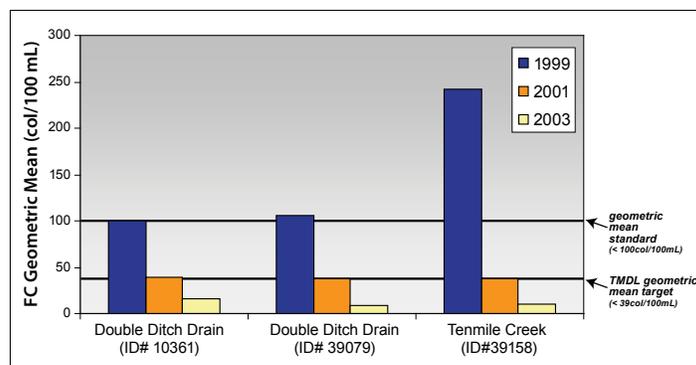


Figure 2. These three Nooksack River tributary segments meet both the geometric mean water quality standard and the target outlines in the Nooksack River Basin TMDL.

By 2003, 480 acres of the Portage Bay shellfish beds met National Shellfish Sanitation Program standards, prompting the Lummi Nation to reopen them for harvest. The remaining 115 acres of Portage Bay shellfish beds reopened in 2006. However despite the improvements, the Lummi Nation remains concerned because the tribe's recent monitoring results indicate that FC levels have risen and sometimes exceed standards in the lower mainstem Nooksack River.

Additionally since 2003, budget constraints and programmatic limitations have reduced technical and financial assistance for monitoring water quality, implementing farm plans and inspecting dairies throughout the Nooksack River Basin—all of which are critical to achieving continued water quality improvements.

## Partners and Funding

Numerous partners have contributed to Nooksack River restoration efforts over the past decade, including the Lummi Nation, Ecology, Portage Bay Shellfish Protection District, Whatcom CD, Whatcom County, U.S. Environmental Protection Agency, the U.S. Department of Agriculture's Natural Resources Conservation Service, the Nooksack Salmon Enhancement Association, Dorie Belisle and the Tenmile Creek Watershed Restoration Project, and concerned citizens. Since 1999, more than \$1.7 million in CWA section 319 funds and almost \$900,000 from Ecology's Centennial Clean Water Fund have supported these groups' watershed restoration and monitoring projects.



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